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OF

PHYSICAL DIAGNOSIS

J. H. Hospital.

OF THE

Circulatory and Respiratory Systems

PREPARED FROM THE LECTURES
OF

THOMAS BARNES FUTCHER, M.B.,
Associate Professor of Clinical Medicine,
The Johns Hopkins University Medical School

By JOHN GARDNER MURRAY, JR.

1915

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PREFACE.

For several years I have conducted, in connection with the course in Physical Diagnosis in the Third Year at the Johns Hopkins Medical School, a weekly recitation covering the more important diseases of the Circulatory and Respiratory Systems. It has been my custom to tabulate as concisely as possible the physical signs of the various pathological lesions.

This little book is being published by Mr. John Gardner Murray, Jr., from notes taken by him during the session of 1913-1914. I have looked over the manuscript copy submitted to me and feel that the subject matter has been accurately and attractively presented.

The idea of publishing these notes is entirely original with Mr. Murray. He thought they might prove of service to subsequent classes of students. The request that I consent to their publication was readily granted.

T. B. FUTCHER.

Baltimore, May 3, 1915.

THE SOURCES OF A PHYSICAL DIAGNOSIS.

The History.

The Physical Examination.

THE HISTORY.

COMPLAINT:

Give in the patient's own words his chief symptoms and not his or his doctor's diagnosis.

FAMILY HISTORY:

Obtain a specific statement regarding the immediate family—father, mother, brothers, sisters. Make a note as to their ages, families if married, condition of health if living or their ages and causes of death if dead.

Obtain a specific statement concerning tuberculosis, malignant disease, heart disease, kidney disease, thyroid disease, obesity, arthritis, nervous and mental disorders and alcoholism in the immediate family and, if indicated, make note of these disorders in the patient's grandparents and other relatives.

MARITAL HISTORY:

If the patient is married obtain a specific statement regarding the number of years married, the age and health of his wife if living, or age, date after marriage and cause of death; the number of miscarriages his wife has had and when. If female, ask the patient concerning her husband, his age and health if living or if dead age, date after marriage and cause of death and ask about deliveries and miscarriages. If the patient has no children ask concerning preventive measures.

PAST HISTORY:

General Health: Always make a note concerning the patient's general health; ask concerning operations, stating anaesthesia used. Inquire concerning examinations for life insurance, giving date when last accepted or first rejected.

Acute Infections: Obtain a specific statement regarding the acute infections, noting first the diseases of childhood with special reference to pertussis, parotitis, morkilli, scarlatina, varicella, diphtheria, chorea and rheumatic fever. Note whether the patient has had variola, typhoid fever, malaria, pneumonia or pleurisy. When there is a history of any infection it is desirable that there be full notes regarding its duration, severity, complications, recurrences, etc.

Then a review of the different systems of the body as follows:

Head: Headaches, severity, type and location. History of attacks of vertigo or syncope. Pain over sinuses.

Eyes: Pain, discharge, flashes of light and spots or specks in front of eyes, disturbances in vision, asthenopia, glasses and reason for them.

Ears: Pain, discharge, disturbance in audition and tinnitus. Tenderness or pain in mastoid region.

Nose: Pain, discharge, epistaxis, disturbances in olefaction or breathing.

Mouth: Condition of teeth, toothache, how many teeth lost and how, general condition of lips and gums, ulcers, excessive salivation, disturbances in salivation, gustation or chewing.

Throat: Sore throat or tonsillitis (may be periodic), quinsy, laryngitis, dysphonia, aphonia or dysphagia.

Cardio-respiratory: Cyanosis, dyspnoea on exertion, paroxysmal dyspnoea, orthopnoea, Cheyne-Stokes respiration, oedema—may be of extremities, face, entire body (anasarca) or even anasarca with ascites, palpitation, precordial pain, anginoid pains on exertion, attacks of true angina pectoris. Chronic cough, matinal cough, seasonal colds, bronchitis, expectoration (amount and type), haemoptysis and noctidrosis.

Gastro-intestinal: Appetite and digestion; habits of eating, frequency and regularity of meals, kind of diet, noting special fondness for certain articles as sweets, meats, condiments, salt, etc., usual amount of coffee, tea and water daily. Eructation, nausea and vomiting, haematemesis. Condition of bowels, noting number and time of stools daily, and whether normal in amount and size; if constipated, state cathartic used; passage of parasites or calculi. Presence of haemorrhoids, melena, abdominal discomfort or pain, its location, type and relation to meal time. History of jaundice, abdominal operations, etc.

Genito-Urinary: Libido, potentia, frequency and satisfaction of sexual intercourse, sexual perversions. Kidney or bladder disturbances, renal or ureteral colic, passage of calculi, polyuria, pollakiuria, ischuria, oliguria,

anuria, dysuria, haematuria, pyuria, nocturia and how often.

Venereal: Obtain specific statements regarding infections with Ducrey's bacillus, Neisser's coccus and Treponema pallidum, making note of the date of infection and how long before admission, whether treatment was taken or not and for how long. In case of a luetic infection, make special note of time of infection, site of primary, kind and length of treatment and history of secondary manifestations in eyes, mouth, skin, hair and long bones.

Menstrual: Ask female patients specific questions concerning the menses: the age at which they first started, the interval between periods in days, duration in days, menorrhagia, amenorrhoea or normal flow, dysmenorrhoea and whether it occurs before, during or after the flow, the date of the last period and the one immediately preceding or if the menopause has occurred, its date and the presence or absence of symptoms at that time. Ask specifically concerning metrorrhagia.

Nervous and Neuro-Muscular: Nervous spells, convulsions, shocks, worries, mental depressions or elations. Sleep (restful or disturbed), insomnia, dreams, neuralgias, neuritides, sciaticas, palsies, paralyses, trophic disturbances, sensory disturbances, muscular rheumatisms, myalgias, atrophies, dystrophies, etc.

Habits: Occupation—Avoid any such general term as laborer unless it is further qualified, state whether the work is inside or outside (and make note of ventilation or overcrowding), whether exposed to the weather and extremes of temperature or not. If employed in industrial plants, inquire into exact nature of work done, with special reference to possible exposure to metallic poisons as lead, arsenic, mercury, copper, chromic acid, etc. Alcohol—Obtain a specific statement concerning the amount of alcohol and in what forms used daily and at what hours of the day the patient drinks, especially if he drinks before breakfast. Tobacco—Obtain a specific statement also regarding the tobacco used by the patient daily in the form of cigars, cigarettes, in a pipe, by chewing or by using snuff. Drug Addiction—Make inquiries concerning drug habits, i. e., morphinism, codeinism, heroinism, bromidism, etc. Habitat—Make a note as

to the habitat and the method of sleeping, being sure to ascertain whether windows are raised throughout the year. Exposure to Infection—In the case of a patient suspected of being ill with an infectious disease make inquiry regarding water and milk supply, environment, any exposure to the disease suspected, etc. Average weight—Always make a note as to the average weight of the patient, best previous weight and date and weight before onset of present illness.

PRESENT ILLNESS:

No special rules can be laid down for this, but it will usually be found best to go over the history of the present illness with the patient before taking notes, letting him tell the story, as far as possible, in his own way, only asking questions when necessary, especially avoiding leading questions. Then go over the history a second time, carefully taking notes. This enables one to get a more or less connected history of the illness which is often otherwise impossible.

Start the history at the beginning of the present illness and make a specific note as to the condition before that. So often patients give a definite time of onset and on questioning it is found that they have been ill for some time before. Get date of onset (month, day and year) and state how long in figures (months, weeks or days) before admission this date is and give the initial symptoms, type of onset and probable exciting cause as exposure, excess, exertion, etc. Then bring the history forward in as connected a way as possible, endeavoring to make a concise, connected story of it. Try to place the points relating to one system together by reviewing the different systems of the body as in the Past History. Thus:—If there be gastric symptoms, try to place the history of pain, eructation, vomiting, etc., all together, so that they are not scattered through in separate places. Always try to get complete details depending on the disease. Thus:—If it be a case of fever, obtain specific notes regarding the mode of onset, chill, sweating, cough, etc. If it be a case of diarrhoea, specific notes regarding the number of stools, their character, whether blood or mucus are present, the question of pain, etc. If it be a case of "rheumatism" state what joint or joints were first involved and the sequence of the involvement of

other joints; state whether the joints are painful, swollen or reddened; whether the tonsils were affected and whether there has been any focus of infection or suppuration in any part of the body—teeth, nose, accessory cavities, ears, urethra and prostate, etc.

In all cases, inquire into the patient's ability to work, try to get a specific statement regarding loss of weight since onset of illness and ask the patient whether he is getting better or worse.

At the end of Present Illness make a note on mental condition of patient, such as promptness with answers, contradictions, condition of memory, etc., to indicate reliability of history.

THE PHYSICAL EXAMINATION.

The Fundamental Procedures of Examination.

I. **Inspection:** Have patient well exposed in good light.

II. **Palpation:** Use palm or whole hand with appropriate pressure.

III. **Percussion:** Use second phalanx of second digit of left hand as pleximeter and second digit of right hand as plexor.

IV. **Ausculation:** May be direct or indirect, the latter monaural or binaural.

Outline For Complete Physical Examination.

Always start with a note concerning temperature, rate of pulse and rate of respirations.

General Observations: Healthy or ill looking, ability to walk and gait, size, height, weight, attitude, decubitus and general nutrition.

Skin, Mucous Membranes and Connective Tissue: Pale, flushed, cyanotic, jaundiced; cold, hot, dry, moist; rough, desquamating, calluses, tumors, scars, eruptions, haemorrhages purpura; oedema, myxoedema, emphysema. Distribution of hair and fat. Presence of parasites.

Glandular System: Parotid, submaxillary and sublingual salivary glands. Suboccipital, mastoid, submental, posterior and anterior cervical, supraclavicular, axillary, epitrochlear and inguinal lymph glands. Thyroid gland and thyroid isthmus.

Head: Size, shape, symmetry, protuberances, scars, tenderness.

Facies: Placid, stupid, anxious, oedematous, myxoedamatous, acromegalic, symmetrical or asymmetrical. Pale, flushed or cyanotic.

Eyes: Exophthalmos, endophthalmos, ophthalmoplegia (strabismus, ptosis, lagophthalmos), sclerae (jaundiced or pigmented, haemorrhages, scars); subconjunctival haemorrhages, conjunctivitis, discharge (purulent or excessive lacrimation); movements of lids, nictitation,

extraocular movements, nystagmus (horizontal, vertical or rotary). Presence or absence of eye signs—i. e., von Graefe's, Dalrymple's Moebius's, Stellwag's, Joffroy's. Presence of arcus senilis and its extent. Pupils,—mydriasis, myosis, anisocoria, outline, reaction to accommodation and light (both directly and consensually), presence of hippus. Intraocular tension. Vision (amblyopia, diplopia, hemianopia, photophobia or amaurosis), necessity for glasses and why. Ophthalmoscopic examination.

Ears: Deformities in shape, color, tophi, disturbances in audition, discharge, pain, mastoid tenderness. Otoscopic examination.

Nose: External deformities and symmetry, deviations, ulcerations and perforations of the septum, disturbances in breathing (tumors, obstruction or hypertrophied turbinates), discharge, epistaxis. Disturbances in olefaction.

Mouth: Disturbances in salivation. Breath (foul, alcoholic, fruity, urinous). Dysarthria or anarthria. Tongue: protrusion, tremor and twitchings, color, dry or moist, coated, mucous patches, fissures, ulcerations, scars leucoplakia, rough, dental identations, disturbances in gustation. Gums and teeth; color (lead line or discolorations), haemorrhages, pyorrrhoea alveolaris, deformities of teeth (Hutchinson's especially), caries, fillings and number of teeth missing.

Pharynx: Tonsils and peritonsillar tissue, retropharyngeal bulgings, uvula, palate and palatal tissue (scars and perforations), dysphagia, pharyngeal and palatal paralyses or reflexes.

Larnyx: Sound of voice, dysphonia or aphonia, ability to sustain voice sounds as in singing, speech defects, hoarseness, character of cough.

Neck: Torticollis, scoliosis, abnormal fulness (tumors, cysts, abscesses), visible or palpable thyroid gland or thyroid isthmus, prominence of thyroid cartilage, venous and arterial pulsations. Note presence or absence always of Oliver's tracheal tug.

Thorax:

Landmarks: Front: —Clavicles, Angulus Ludovici, *formed* by the junction of manubrium and gladio-

lus marks the II rib, ensiform cartilage. Back:—Spine of the VII cervical vertebra and the scapulae. Regions: Front:—Horizontally: the supraclavicular fossae, the suprasternal notch, the infraclavicular fossae of Morenheim and the interspaces; vertically: the regions between the midsternal, lateral sternal, parasternal, midclavicular or mammillary and anterior axillary lines. Lateral:—Horizontally: the interspaces; vertically: the regions between the anterior axillary, mid-axillary and posterior axillary lines. Back:—Horizontally, the supraspinous fossae, infraspinous fossae, the right and left interscapular regions and the interspaces; vertically: the regions between the posterior axillary, scapular, paravertebral, lateral vertebral and midvertebral lines.

Topographical Anatomy:

Lungs and Pleurae. Limits: From the apex about 2.5 cm. above clavicle (slightly lower on left) to the region of II chondrosternal junction in the midsternal line, to VI chondrosternal junction in the midsternal line, out to cross midclavicular line at VI rib and anterior axillary line at VII rib, crosses midaxillary line at VIII rib and posterior axillary line at IX rib, scapular line at X rib, paravertebral, lateral vertebral and midvertebral lines at XI rib. The pleurae are about one rib lower in the midclavicular, anterior axillary, midaxillary, posterior axillary, scapular, paravertebral, lateral vertebral and midvertebral lines. Division of lobes: The lower limit of the upper lobe is marked by a line from II dorsal spine to VI chondrosternal junction in midclavicular line. The middle lobe (on right only) is about an equal division of the lower lobe and is marked by a line from IV chondrosternal junction to the point where the lower limit of upper lobe crosses the midaxillary line.

Precordium. Limits (Sibson) Upper Limit: Line across sternum in II interspace extending 2.5 cm. to left and right of sternum. This line touches the right auricle and its appendage, the pulmonary conus and the tip of the left auricular appendage. Right limit: Curved line from right end of upper limit to VI right choudrosternal junction with its convexity outwards a distance of 2 cm. from the midsternal line in the IV right interspace. This is the edge of the right auricle. Left limit: Line from left end of upper limit to P. M. I. in V left interspace 9 cm. from midsternal line or 2.5 cm. inside of midclavicular line. This marks almost entirely the left ventricle. Lower limit: Line from VI right chrondrosternal junction to P. M. I. Never mark this as it is impossible to distinguish cardiac dulness from hepatic dulness. A line from III left chondrosternal junction to VI right chondrosternal junction marks the furrow between the right ventricle and auricle and acts as a guide to the plumonary conus. The space in the back between two horizontal lines drawn at the VI and VIII dorsal vertebrae marks the base of the heart posteriorly.

Position of Heart Valves (Luschka).

1. Mitral valve is situated beneath III left chondrosternal junction. Sounds heard best at P. M. I.
2. Tricuspid valve is situated at level of IV right chondrosternal junction on line joining III left chrondrosternal and V right chrondrosternal junctions. Sounds best heard here.
3. Aortic valve is situated behind middle of sterum at level of IV right chrondrosternal junction. Sounds best heard in II right interspace.
4. Pulmonary valve is situated in II left interspace about 1 cm. to left of sternum. Sounds best heard in II left interspace.

General.

I. Inspection. Presence of enlarged veins. Distribution of hair on thorax and in axillae. Note position of mammillae and mammae. Presence of lactation or tumors. Note size, shape and conformation of chest. The

Dr. E. S. du Bray.

normal ratio is anteroposterior diameter is to the transverse diameter as 5 is to 7. Note symmetry of chest and costal angle (normally not greater than 90 degrees).

Types of Chest Deformities.

I. Indicating predisposition to disease.
  1. Alar or pterygoid.
  2. Flat or "phthinoid."

II. Indicating pre-existing diseases.
  1. Rachitic chest.
  2. Harrison's grooved chest.
  3. Pigeon chest.

III. Indicating existing disease.
  A. Symmetrical.
    1. Barrel chest.
    2. Bilateral retraction.
  B. Asymmetrical.
    1. Unilateral enlargement.
    2. Unilateral diminution.

IV. Local changes causing deformities.
  1. Bulgings as in empyema, aneurism, effusion, tumors, etc.
  2. Local retractions as in tuberculosis.
  3. Funnel chest or "Trichterbrust."

II. Palpation. Palpate carefully for tumors or tenderness, especially in the mammae.

III. Percussion. Dorsal spine is normally resonant. Normally no retromanubrial dulness.

IV. Auscultation. Auscultation of the thorax in general is unnecessary.

Lungs:

1. Inspection: Rate and character of respirations (free, shallow or deep, Kussmaul's, Biot's, Cheyne-Stokes). Dyspnoea, paroxysmal dyspnoea, tachypnoea or orthopnoea. Expansion (bilateral or unilateral diminution). Obliteration, abnormal fulness, retraction or pulsation of interspaces. Litten's sign.

Causes of Disappearance of Litten's Sign.

I. Pleural
  a. Effusion (most frequent cause).
  b. Pneumothorax.
  c. Pleural adhesions.

II. Palpation: Position of P. M. I., character of impulse, shock of normal sounds, heavings, abnormal pulsations (note whether expansile), presence of abnormal or exaggerated shocks, presence of thrills and friction fremitus. Look for abnormal positions of heart.

III. Percussion: Percuss out relative and absolute cardiac dulness. Note presence or absence of absolute cardiac dulness and retromanubrial dulness especially. Note position of heart. Presence or absence of Traube's semilunar space and acuteness of cardio-hepatic angle.

IV. Auscultation: Heart sounds at apex and base, note any diminution, accentuation, rhythm (normal or not, doubling, gallop and type), presence of third sound, relative intensity of second pulmonic and second aortic sounds. Note presence or absence of murmurs as follows: seat, time and relation to heart sounds, character, direction of transmission and duration.

Types of Murmurs.

A. 1. Endocardial.
   2. Exocardial.
B. 1. Regurgitant (indirect)
   2. Stenotic (direct)
C. 1. Organic.
   2. Functional.

Pulse:

Note whether equal and synchronous in two radials. Note volume, tension (systolic and diastolic blood pressure) and whether of same pressure in two radials, note regularity of force and rhythm, special qualities and condition of vessel wall. Compare apex beat with radial pulse.

Varieties of Radial Pulse.

1. Pulsus magnus—large volume
2. Pulsus parvus—small volume
3. Pulsus frequens—quick pulse
4. Pulsus rarus—slow pulse
5. Pulsus tardus—long pulse wave
6. Pulsus celer—short pulse wave
7. Pulsus durus—hard pulse
8. Pulsus mollis—soft pulse

9. Pulsus plenus—full pulse
10. Pulsus vacuus—empty pulse
11. Pulsus deficiens—absence of some beats
12. Pulsus irregularis—irregular in force and rhythm
13. Pulsus bigeminus—two beats and a pause
14. Pulsus trigeminus—three beats and a pause
15. Pulsus quadrigeminus—four beats and a pause
16. Pulsus bisferiens—two distinct waves; summit and tidal
17. Pulsus dicroticus—exaggerated dicrotic wave
18. Pulsus anacroticus—exaggerated tidal or anacrotic wave
19. Pulsus paradoxicus—faster during inspiration
20. Pulsus recurrens—pulse felt below point of compression; due to anastomoses of palmar arch with radial artery.

Abdomen:

Landmarks: Costal margin, ensiform cartilage, crests of ilium, Poupart's ligaments, symphysis pubis. Umbilicus is usually in mid-line at a point opposite the IV lumbar vertebra; a point slightly to the left of it and 1.5 cm. below it is about at the bifurcation of the aorta. Linea alba and linea similunaris.

Regions: Infrasternal notch. Other conventional regions are formed by two transverse lines—one at the costal margin and the other at the level of the spines of the ilium and two vertical lines drawn perpendicularly from the middle of Pourpart's ligaments. These regions are the left hypochondriac, epigastric, right hypochondriac, left lumbar, umbilical, right lumbar, left iliac, hypogastric and right iliac.

Topographical Anatomy: The left hypochondriac region contains: Most of stomach, left lobe of liver, spleen, splenic flexure of colon, left kidney and part of left ureter.

The epigastric region contains: Cardiac end of stomach, pyloric end of stomach, pylorus and part of duodenum, middle lobe of liver, transverse colon.

The right hypochondriac region contains: Right lobe of liver, gall bladder, duodenum, hepatic flexure of colon, superior pole of right kidney.

The left lumbar region contains: Descending colon and part of ileum, left ureter.

The umbilical region contains most of ileum and jejunum.

The right lumbar region contains: Ascending colon, lower pole of right kidney and right ureter, small part of ileum.

The left iliac region contains: Sigmoid flexure of colon and end of left ureter.

The hypogastric region contains: Bladder, sigmoid and rectum.

The right iliac region contains: Caecum and vermiform appendix, caecal end of ascending colon, end of right ureter.

I. Inspection: Size, shape, deformities, thickness and tension of abdominal walls, tumors, herniae or masses, position and type of umbilicus, lineae striae, dilated veins (caput medusae), respiratory movements, peristaltic movements, pulsations. Make note about distribution of pubic hair.

II. Palpation: Thickness and tension of abdominal walls, tender areas; muscle spasms or resistance; herniae; tumors or masses (location, size, shape, surface tenderness, mobility, pulsation and relation to organs). Fluctuation wave (true and false), splashing, pulsations and abnormal shocks (may feel aorta in thin people). Position, outline, mobility and consistency of liver (normally not below costal margin). Position, outline and consistency of gall bladder (normally not felt). Position, shape and outline of stomach (inflate with mixture of sodium bicarbonate and tartaric acid). Palpable and movable kidneys. Inflated colon. Spleen, position, outline, shape, consistency. Bladder. Appendix or tenderness around McBurney's point. Position of pregnant uterus and its height.

III. Percussion: Relative and absolute hepatic dulness on both sides, outline of enlarged liver; outline of enlarged gall bladder, outline of stomach; outline of splenic dulness; outline of pregnant uterus; outline of tumors. Modifications of percussion note due to inflated intestines or colon. Fluid and shifting dulness.

IV. Auscultation: Splashing and gurgling sounds. Pulsations in arteries. In pregnant women the position and rate of foetal heart sounds and the placental bruit.

Rectum and Anus: Note presence of haemorrhoids, fissures, fistulae, ulcers, abscesses, strictures, tumors, etc., in every case.

Genito-Urinary:

I. Inspection: Note examination of urine (amount, gross characteristics, reaction, specific gravity, presence of albumen and reducing bodies and microscopic examination of sediment, guaiac test, diacetic acid and acetone tests, bile tests, Diazo reaction, etc.) In men:—Penis and glans,—size, shape, malformations, ulcerations or scars, phimosis and paraphimosis, discharge. Testes,—size, shape. Scrotum,—scars, ulcerations, oedema, etc. In women: Introitus, outlet (virginal, marital, nulliparous, multiparous or relaxed), hymen (intact or ruptured), malformations, condition of perineum, discharge from urethra or leucorrhoea.

II. Palpation: In men:—Testes, size, shape, consistency, condition of epididymes (globus major and minor) and tenderness. Examine prostate and seminal vesicles rectally, noting size, shape, consistency and tenderness. In women: Note conditions of outlet, hymen, urethra, malformations, cervix (patency, lacerations, consistency). Uterus, size, shape, consistency, malformations. Adnexa, note size, shape, tenderness and adhesions. Tumors, position, mobility, size, shape, consistency and relation to other organs.

Nervous and Neuro-muscular: Note gait and attitude or decubitus; facial symmetry and body symmetry. Note weaknesses, palsies, paralyses, ataxia (Romberg's sign and knee-heel test). Note mental condition (intelligence, emotional reactions, special defects as hallucinations, etc., delirium, apathy, stupor, etc.), memory for recent and remote events, orientation as to time, place and persons. Note presence of neuritides, neuralgias, sciaticas, etc. Note condition of joints, bones, skin, nutrition of muscles and vasomotor system.

Reflexes: Pupillary, palatal, jaw jerk, jaw clonus, biceps, triceps, periosteoradial, upper and lower abdominal, cremasteric, knee jerks, knee clonus, ankle jerk, ankle clonus, response to plantar stimulation (Babinski), ***Kernig's sign***, etc.

THE CIRCULATORY SYSTEM.

THE NORMAL CIRCULATORY SYSTEM.

PHYSICAL SIGNS:

I. Inspection:

General:

1. No dyspnoea or orthopnoea.
2. No cyanosis.
3. No oedema.
4. No dilated superficial veins.
5. No abnormal pulsations in jugulars, carotids or retinal vessels.
6. No capillary pulse.

Local:

1. P. M. I. in V interspace, 2.5 cm. inside left midclavicular line.
2. P. M. I. usually localized or punctate in character.
3. No retractions of interspaces.
4. No precordial bulgings.
5. Normally slight pulsations seen in III and IV left interspaces.
6. Normally no dilated veins over precordium.

II. Palpation:

1. P. M. I. as under Inspection. Apex beat is usually just inside P. M. I.
2. Normally feel the slight shock of first sound at apex.
3. Normally no bulgings.
4. Normally no pulsations.
5. Normally no thrills.
6. Normally no friction fremitus.
7. Normal pulse:—Volume usually full; tension (vessel wall easily compressed) systolic pressure 120-130; diastolic pressure 80-90; rhythm and force usually regular; rate usually 70-80 to minute; no special qualities; vessel wall normally not felt.

III. Percussion:

1. Normal cardiac dulness:
    a. Relative or deep dulness marks actual extent of the heart. Begins above in III left interspace at sternal border

and extends on the left in a line curved outwards to the P. M. I. in V left interspace 2.5 cm, inside mid-clavicular line and on the right in a line curved outwards to the level of VI costal cartilage in the right parasternal line.

b. Absolute or superficial cardiac dulness marks area of heart not covered by lungs. Begins above at the IV left chondrosternal junction and extends on the left in a curved line to the P. M. I. and on the right to the V right chondrosternal junction.

Any increase in the deep or the absence of superficial cardiac dulness is pathological.

2. Cardio-hepatic angle is normally acute.
3. Traube's semi-lunar space is normally tympanitic.
4. Any retromanubrial dulness is pathological.

IV. Auscultation:

1. Normally hear the first, second and occasionally, the third heart sounds.

Causes of Heart Sounds.

a. First Sound:
   1. Closure of auriculo-ventricular valves.
   2. Contraction of ventricles.
   3. Impact of ventricles against chest wall.

b. Second sound:
   1. Closure of semilunar valves.

c. Third sound:
   1. Increased tension of auriculo-ventricular valves when ventricle is half full.
   2. Contraction of auricles.

Systole occurs during the interval between the first and second sounds. Diastole occurs during the interval between the second and third sounds. The third sound occurs at the diastasis during diastole and therefore is about mid-diastolic in time.

Normally at the apex the first sound is longer, more booming in pitch and more accentuated than the second sound which is sharp, short and not loud; while at the base the second sound is more accentuated.

The relative intensity of the second pulmonic and second aortic sound varies with age as follows:

In 90% of individuals under 10....$P^2 > A^2$
In 66% of individuals between 10 and 20 ....$P^2 > A^2$
In 50% of individuals between 20 and 30 ....$P^2 > A^2$
and so on until
In 99% of individuals over 60.....$A^2 > P^2$

Often great difficulty is experienced in determining the heart sounds. Systole can be readily felt in the carotids or over P. M. I. and the systolic impulse occurs with the first sound.

2. Normally no murmurs heard over heart.
3. Normally no friction rub heard.

DISEASES OF THE CIRCULATORY SYSTEM.

Pericarditis
Chronic Valvular Disease
Congenital Heart Lesions
Aneurisms

PERICARDITIS.

CLASSIFICATION:

A. Primary or Idiopathic Pericarditis.
B. Secondary Pericarditis.

ETIOLOGY:

- A. Primary Pericarditis
  - Tuberculosis
  - Trauma
  - Unknown in certain cases
- B. Secondary Pericarditis
  - Acute rheumatic fever
  - Septic processes
  - Tuberculosis
  - Acute infectious fevers
  - Chorea
  - Terminal, as in chronic Bright's disease (*pericardite britique*), gout, diabetes, etc.
  - By extension
    - a.—from pleurisy, or pleuro-pneumonia
    - b.—from disease of the sternum, ribs or vertebrae
    - c.—from disease of the mediastinal glands
    - d.—through the diaphragm from disease of the abdominal viscera

SYMPTOMS:

1. Pain, not usually intense but may be severe enough to force patient to assume the sitting posture.
2. Fever, as a rule not high.
3. Dyspnoea, may even be orthopnoea.

TYPES:

1. Acute Fibrinous Pericarditis.
2. Pericarditis with Effusion.
3. Chronic Adhesive Pericarditis.

ACUTE FIBRINOUS PERICARDITIS.

SPECIAL ETIOLOGY:

None.

SPECIAL SYMPTOMS:

None.

PHYSICAL SIGNS:

I. Inspection.

Nothing is seen on **Inspection** if the heart has previously been normal.

II. Palpation.

1. Friction fremitus may be palpable.
2. Pulse,—not remarkable.

III. Percussion.

Nothing is found on **Percussion** if the heart has previously been normal.

IV. Auscultation.

1. A to and fro, superficial, grating friction rub, best heard over precordium in III and IV interspaces, although it may be heard at the apex only, or over the whole heart. The sound is usually scratchy or leathery (new leather sound—*bruit de cuif neuf*), is very superficial and is very much increased by pressure of the stethoscope. If single, it is systolic, if double it is the to and fro friction rub and is systolic and diastolic, or if triple it is the canter rhythm. The rubs are not synchronous with complicating cardiac murmurs.
2. The heart sounds may be greatly enfeebled from an associated myocarditis.

MAIN POINTS IN THE DIAGNOSIS:

1. Friction fremitus.
2. Friction rub.

DIFFERENTIAL DIAGNOSIS:

1. Pleuro-pericardial friction rub.
2. Combined mitral insufficiency and aortic insufficiency.

REMARKS:

With pleuro-pericardial friction there may or may not be an actual pericarditis. The confusing cases are those where there is a fine pleurisy with a rub having a cardiac rhythm. This rub often stops if the breath is held in forced expiration.

PERICARDITIS WITH EFFUSION.

SPECIAL ETIOLOGY:

None.

SPECIAL SYMPTOMS:

Aphonia may occur because of pressure on laryngeal nerve.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Dyspnoea or orthopnoea.
2. Cyanosis.
3. Engorged veins in the neck.
4. Dysphonia or aphonia, due to pressure on the recurrent laryngeal nerve.
5. Dysphagia.
6. Pain: patient may lie on left side or assume the sitting posture.

Local.

1. P. M. I., indistinct or obliterated, may be displaced outward.
2. May be precordial bulging, especially in children.
3. The intercostal spaces may be partly obliterated.
4. May be diminished expansion of the left side of the chest.
5. Ewart's sign. The left clavicle is elevated causing a prominence of the sternal end of the left I rib.

II. Palpation.

1. Confirm Inspection, especially concerning P. M. I.
2. One may still feel a friction fremitus in the upper part of the chest.
3. Pulse—volume diminished, tension decreased, rhythm and force irregular, rate increased, *pulsus paradoxus* (pulse weaker during inspiration than during expiration), vessel wall according to arteriosclerosis.

III. Percussion.

1. Pear shaped cardiac dulness.

2. Rotch's sign. Obliteration of the cardiohepatic angle.
3. Bamberger's area of dulness in the interscapular region.
4. May be shifting dulness on changing position or on standing.
5. Sometimes there is slight tympany over the lung compressed on each side of the heart.
6. Impaired resonance in the left axilla.

IV. Auscultation.

1. Enfeeblement of the heart sounds.
2. May still hear a friction rub.
3. Second pulmonic sound often accentuated.
4. Compressed lung may show enfeebled tubular breathing.
5. May often find endocardial murmurs.

MAIN POINTS IN THE DIAGNOSIS:

1. Dyspnoea or orthopnoea.
2. Indistinct P. M. I.
3. Pulse.
4. Pear shaped cardiac dulness.
5. Indistinct heart sounds.

DIFFERENTIAL DIAGNOSIS:

1. Dilated heart. There is a valvular quality to the heart sounds not heard in pericarditis with effusion.
2. Pleurisy with effusion.
3. Myocardial insufficiency.

REMARKS:

Pericarditis with effusion is usually preceded by a dry or plastic pericarditis.

The fluid may be a transudate or an exudate and may be serous, hemorrhagic or purulent.

Paracentesis pericardii is performed at the edge of the left border of the sternum inside of the left internal mammary artery in the V interspace or just outside of the P. M. I. at the same level.

CHRONIC ADHESIVE PERICARDITIS.

SPECIAL ETIOLOGY:

The final results of acute pericarditis.

SPECIAL SYMPTOMS:

Not usually present.

PHYSICAL SIGNS:

I. Inspection.
  1. P. M. I. usually diffuse and displaced downward and outward; also usually fixed.
  2. Often marked precordial bulging and heaving.
  3. Systolic retraction at apex.
  4. Systolic retraction at left costal margin and in left epigastrium.
  5. Broadbent's sign. Systolic retraction in X and XI interspaces near angle of left scapula along the diaphragm.
  6. Systolic retraction over body of heart.
  7. Friedreich's sign. Diastolic collapse of the veins in the neck.

II. Palpation.
  1. Confirm Inspection.
  2. Diastolic shock.
  3. Pulse. *Pulsus paradoxus* occasionally.

III. Percussion.
  1. Enormous increase in the transverse cardiac dulness.
  2. Fixation of the upper limit of cardiac dulness on deep breathing.

IV. Auscultation.

Nothing characteristic. There may be murmurs due to endocarditic lesions originating at the time of the preceding fibrinous pericarditis.

MAIN POINTS IN THE DIAGNOSIS:

1. The systolic retractions over the heart.
2. Diastolic shock.
3. Large transverse cardiac dulness.

DIFFERENTIAL DIAGNOSIS:

Not difficult.

REMARKS:

The adhesions may be between the parietal and visceral layers of the pericardium and in addition there may be adhesions between the parietal pericardium and the pleura and the chest wall. The peritoneum may also be involved producing Pick's disease.

There are no physical signs unless there are mediastinal adhesions.

CHRONIC VALVULAR DISEASE.

CLASSIFICATION:

A. Primary chronic valvular disease.
B. Secondary valvular disease.

ETIOLOGY:

A. Primary.
  Sclerosis of valve segments due to high blood pressure.
B. Secondary.
  Sclerosis of valve segments due to
  1. Acute endocarditis.
  2. Specific infectious diseases.
  3. Part of a general arteriosclerosis.
  4. Blood toxins as alcohol, lead, etc.
  5. Metabolic toxins as in gout or Bright's disease.

SYMPTOMS:

Usually no symptoms are present unless there is decompensation. The symptoms of each separate lesion are discussed later.

TYPES:

Chronic valvular disease results in a stenosis (narrowing) or an insufficiency (widening) of the valves. Either stenosis or insufficiency or both may attack each valve of the heart so that there may be:

1. Aortic insufficiency.
2. Aortic stenosis.
3. Mitral insufficiency.
4. Mitral stenosis.
5. Tricuspid insufficiency.
6. Tricuspid stenosis.
7. Pulmonary insufficiency.
8. Pulmonary stenosis.

AORTIC INSUFFICIENCY.

SPECIAL ETIOLOGY:

1. Arteriosclerosis—due to Venus (lues and sexual excess), Vulcan (overwork), Bacchus (alcoholism), Mars (worry) and Epicureus (overeating).
2. Endocarditis.
3. Rupture of the valve segments.
4. Relative insufficiency (anaemia, aneurism and myocarditis).
5. Congenital malformations (bicuspid condition).

SPECIAL SYMPTOMS:

1. There may be no symptoms at all.
2. Headaches and flashes of light.
3. Vertigo.
4. Faintness on rising quickly.
5. Pain may be an early symptom.
6. Dyspnoea and oedema in broken compensation.
7. Cough due to pulmonary congestion.
8. Cyanosis is rare.
9. Mental symptoms are common.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Aortic facies; pale, not much cyanosis unless there is an associated mitral insufficiency.
2. Quick collapse of the peripheral arteries.
3. Pulsation in the peripheral arteries, episternal notch and over carotids behind angle of jaw, also in retinal arteries.
4. Capillary pulse in fingers, skin and mucous membranes.

Local.

1. P. M. I. displaced downward and outward —in mitral insufficiency the displacement is only outward.
2. Precordial bulging and heaving.

II. Palpation.

1. Confirm displacement of P. M. I.
2. Confirm precordial bulging and heaving.
3. May be diastolic thrill at aortic area.

4. May be diastolic thrill at the apex if there is a Flint murmur.
5. Pulse—large volume, systolic pressure high and diastolic pressure low, usually regular in force and rhythm, rate usually slightly increased, Corrigan's water hammer or collapsing pulse (*pulsus altus et celer*), vessel wall usually thickened.

III. Percussion.
   1. Increased cardiac dulness to left and downward because the hypertrophy is eccentric.
   2. Occasionally substernal dulness due to dis-stension of the aorta.

IV. Auscultation.
   1. Usually a soft blowing or musical diastolic murmur heard at aortic area or transmitted down left sternal border. Musical murmur often when a valve segment is torn, ruptured or a mass of vegetation is present. The murmur may be maximal at the apex or in the left mid-axillary line in the IV interspace.
   2. The second aortic sound may or may not be absent.
   3. Usually there is a roughish systolic murmur at the aortic area due to a roughening of the valve segments and not to a stenosis.
   4. There may be a Flint murmur at the apex. Usually a rumbling and vibrating diastolic or presystolic murmur heard at about the same area as the murmur of mitral insufficiency. This is present, according to Thayer, in about 50 per cent. of cases of uncomplicated aortic insufficiency. The differentiation between the Flint murmur and the murmur of the mitral stenosis is made on the following points:

	Mitral Stenosis.	Flint Murmur.
1.	Exaggerated systolic shock.	No systolic shock.
2.	Presylstolic thrill.	Often no presystolic thrill.
3.	Enlarged right heart.	No enlargement to right.
4.	Snapping first sound.	First sound is not snapping.
5.	Loud, rumbling presystolic murmur.	This murmur is low pitched and feebled.
6.	Pulse not collapsing.	Collapsing pulse.

The cause of the Flint murmur is given variously, as:

- a. The interference of two blood streams.
- b. The vibration of tense mitral valve flaps.
- c. A pressure stenosis of the mitral valve.

5. In aortic insufficiency associated with a mitral insufficiency there may be a to and fro murmur down the left sternal border which may be confused with that of a pericarditic friction rub.
6. Pistol shot sound over larger peripheral arteries.
7. Duroziez's double murmur over peripheral arteries on deep pressure with the bell of the stethoscope.

MAIN POINTS IN THE DIAGNOSIS:

1. Displacement of P. M. I.
2. Pulse.
3. Increased cardiac dulness.
4. Diastolic murmur at base of heart or along left sternal border.

DIFFERENTIAL DIAGNOSIS:

Flint Murmur may be mistaken for the murmur of a mitral stenosis and *vice versa.*

REMARKS:

Aortic insufficiency may be fully compensated for years and when uncomplicated is not inconsistent *with* an active healthy life for years.

AORTIC STENOSIS

SPECIAL ETIOLOGY:

1. Arteriosclerosis.
2. Endocarditis.
3. Congenital.
4. Relative dilated aortic arch.

SPECIAL SYMPTOMS:

1. Vertigo and syncope in early stages.
2. Symptoms of decompensation.
    a. Dyspnoea.
    b. Cough.
    c. Oedema.
3. Precordial pain and palpitation, not as commonly as in aortic insufficiency.

PHYSICAL SIGNS:

I. Inspection.
    1. P. M. I. often indistinct because of emphysema, but may be visible and more or less outwardly displaced.
    2. May be precordial bulging, less striking than in aortic insufficiency.

II. Palpation.
    1. Confirm displacement of P. M. I.
    2. Confirm precordial bulging.
    3. Systolic thrill at aortic area.
    4. Apex beat usually forceful.
    5. Pulse—small volume, good tension but may be low, usually regular in force and rhythm, rate usually slow, no special qualities, vessel wall varies with the cause. Pulse curve shows slow rise and fall with a blunt apex. Pulse is important in doubtful cases. This is the *pulsus rarus parvus tardus.*

III. Percussion.
    1. Cardiac dullness increased to left, only marked in late or mixed cases. In aortic stenosis the hypertrophy is concentric.

IV. Auscultation.
    1. Very rough, harsh, long drawn out and often musical systolic murmur traceable

up into the vessels of the neck. May be heard over the whole precordium.

2. Second aortic sound absent or diminished.
3. Systolic murmur at mitral area (often musical) if pressure in the left ventricle is so high that some blood is forced back through healthy mitral valves. This produces the double fan murmur. This murmur may, of course, be due to an associated mitral insufficiency.
4. Usually the diastolic murmur of an associated aortic insufficiency.

MAIN POINTS IN THE DIAGNOSIS:

1. Systolic thrill.
2. Pulse.
3. Hypertrophy of left ventricle.
4. Rough systolic murmur.
5. Feeble or absent aortic second sound.

DIFFERENTIAL DIAGNOSIS:

Usually not difficult if strict attention is paid to physical signs.

Causes of Systolic Murmurs at the Aortic Area.

1. Arteriosclerotic roughening of aortic valves or of the aortic arch causes 98 per cent. of these murmurs.
2. General arteriosclerosis.
3. Transmitted mitral systolic murmur.
4. Dilated arch.
5. Aneurisms.
6. Haemic murmurs.

REMARKS:

Aortic stenosis is relatively rare and great care must be used in diagnosing this lesion.

Concentric hypertrophy of the heart or a thickening of the wall without enlargement of the cavity of the left ventricle occurs in aortic stenosis while eccentric hypertrophy of the heart or thickening of the wall of the heart with enlargement of the cavity of the left ventricle occurs in aortic insufficiency and some forms of adhesive pericarditis.

MITRAL INSUFFICIENCY.

SPECIAL ETIOLOGY:

1. Organic or absolute mitral insufficiency due to disease of mitral valves.
2. Functional or relative due to dilatation of mitral ring.

SPECIAL SYMPTOMS:

These depend upon the degree of decompensation.

1. Dyspnoea only on exertion in well compensated lesions.
2. Cyanosis.
3. Haemoptysis in certain decompensated cases.
4. "Cardiac sleep-start" in very poorly compensated cases.
5. Oedema may be extreme in certain cases.

PHYSICAL SIGNS:

These are also marked only in cases of broken compensation.

I. Inspection.

General:

1. May be signs of broken compensation as dyspnoea, cyanosis and oedema.

Local:

1. P. M. I. may be displaced outward, usually not downward.
2. P. M. I. more diffuse usually in organic or absolute mitral insufficiency.
3. May be precordial bulging.
4. Precordial heave may be present.

II. Palpation.

1. Confirm Inspection concerning P. M. I.
2. May feel precordial heave.
3. Impulse may be heaving.
4. May be systolic thrill at apex.
5. Pulse (in poorly compensated cases) volume varies, tension low, irregular in force and rhythm; rate usually increased, no special qualities, vessel wall varies according to amount of sclerosis.

III. Percussion.

1. Enlargement of heart, principally to left

2. Dulness over bases of lungs in poorly compensated lesions.
3. May be increase in liver dulness, hydrothorax and ascites in badly compensated lesions.

IV. Auscultation.

1. Soft, blowing systolic murmur at P. M. I., usually transmitted outwards, often heard in axilla, at angle of scapula and over whole precordium. May be rough or musical.
2. First sound may or may not be obliterated.
3. Second pulmonic sound is usually accentuated.
4. Second aortic sound may be relatively diminished in intensity.
5. Rhythm may be irregular in cases of broken compensation. Most usual in mitral valve disease.
6. Rales at bases of lungs and tubular breathing if there is a hypostatic pneumonia.

MAIN POINTS IN THE DIAGNOSIS:

1. Dyspnoea, cyanosis and oedema.
2. Enlargement of heart to left.
3. Accentuated second pulmonic sound.
4. Systolic murmur at apex, transmitted outwards.

DIFFERENTIAL DIAGNOSIS:

1. Functional murmurs.
2. Tricuspid insufficiency.
3. Aortic stenosis.
4. Aortic aneurism.

REMARKS:

Mitral insufficiency is extremely common. Many cases never present symptoms and are only found in routine examination of patients. Physical signs and symptoms are present only in cases with broken cardiac compensation.

MITRAL STENOSIS.

SPECIAL ETIOLOGY:

1. Cases following acute endocarditis with chorea or rheumatism.
2. Cases due to a slow sclerosis of the mitral valves.
3. Possibly congenital cases.

SPECIAL SYMPTOMS:

The symptoms are not at all typical but essentially those of cardiac insufficiency.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Often a "cardiac facies," i. e., pinkish cheeks.
2. Pulsating cervical veins.
3. Pulsation in epigastrium due to hypertrophy of ventricles.

Local.

1. P. M. I., not usually displaced in a pure lesion.
2. Bulging and heaving usually at IV and V left costal cartilages.
3. There may be a systolic pulsation in the II and III left interspaces due to the conus arteriosus or the left auricular appendage.

II. Palpation:

1. Confirm **Inspection** concerning P. M. I., pulsations and heavings.
2. Exaggerated systolic shock at P. M. I.
3. A diastolic fremitus, usually presystolic but may be mid-diastolic in time.
4. Often diastolic shock at pulmonic area due to accentuation of second pulmonic sound.
5. Pulse—small volume—tension fair, irregular in force and rhythm, rate usually increased. *Pulsus irregularis perpetuus* (due to auricular fibrillation) vessel wall usually not thickened.

III. Percussion.

1. Enlargement of right ventricle to right, as it hypertrophies.

IV. Auscultation.

1. Rough, vibratory, crescendo presystolic or mid-diastolic murmur heard over a limited area. This leads up to and ends in the snapping first sound.
2. First sound at apex sharp and snapping in well compensated cases.
3. There is usually a systolic murmur at apex due to accompanying mitral insufficiency.
4. Second pulmonic sound markedly accentuated.
5. Rhythm is very irregular when auricular fibrillation has developed.
6. Graham-Steele diastolic murmur heard at pulmonic area. This must not be confused with the murmur of aortic insufficiency.

MAIN POINTS IN THE DIAGNOSIS:

1. Exaggerated systolic shock.
2. Presystolic thrill.
3. Hypertrophy of right ventricle.
4. Rumbling presystolic murmur ending in
5. Snapping first sound.
6. Accentuated second pulmonic sound.
7. Small volume of pulse.

DIFFERENTIAL DIAGNOSIS:

1. Often the differential diagnosis between mitral stenosis and congenital heart lesions is difficult owing to the thrills and murmurs of the former being very pronounced.
2. Occasionally an aortic insufficiency accompanies mitral stenosis. The diastolic murmur of this lesion is very much like the murmur of mitral stenosis, heard at the pulmonic area. This is the Graham-Steele murmur which is due to high inter-pulmonary tension.
3. Tricuspid stenosis.
4. Third heart sound.
5. Aneurism.

REMARKS:

Mitral stenosis is more common in females be-

cause they are more subject to chorea and rheumatism.

The mitral orifice in mitral stenosis may be "Corrigan's button hole contraction" or may be funnel shaped.

The physical signs are variable; with rest, the murmur may quiet down and the signs almost disappear. Murmur and thrill may be absent. The murmur may be confined to a small area, covered by bell of a stethoscope and is usually best heard above and within P. M. I.

Broadbent's Stages of Mitral Stenosis:

1. Hear first sound, second sound and presystolic murmur.
2. Hear first sound and presystolic murmur. Broadbent thinks the second sound drops out because of reduced aortic tension in beginning decompensation.
3. Snapping first sound. This in marked decompensation. Snapping character of first sound is due to reduced volume of blood in the left ventricle on which the ventricle contracts with a snap. Murmur and second sound absent.

TRICUSPID INSUFFICIENCY.

SPECIAL ETIOLOGY:

1. Functional cases. This lesion may act as a safety valve for the pulmonary circulation. Hunter noticed that there was very little factor of safety as the valves are just large enough for the tricuspid ring. The terminal stage of many chronic cardiac lesions.
2. Organic cases. Due to rheumatic, streptococcic, gonococcic endocarditis. May be due to foetal endocarditis.
3. Chronic emphysema with fibrosis of the lungs.

SPECIAL SYMPTOMS:

1. Extreme cyanosis, dyspnoea and oedema.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Cyanosis.
2. Dyspnoea.
3. Oedema.
4. Systolic pulsation in veins of neck.
5. Systolic pulsation of liver.

Local.

1. P. M. I. displaced to left owing to the involvement of the left heart.

II. Palpation.

1. Confirm **Inspection.**
2. Can feel the pulsating liver.
3. Pulse—nothing characteristic. (Usually diminished volume and tension, very irregular in force and rhythm.)

III. Percussion.

1. Marked increase in cardiac dulness to right.
2. Increased cardiac dulness to left.
3. Liver dulness increased markedly.
4. Dulness at bases of lungs due to chronic passive congestion.

IV. Auscultation.

1. Systolic murmur at tricuspid area.
2. Lessening of intensity of second pulmonic sound. May be increased.

MAIN POINTS IN THE DIAGNOSIS:

1. Pulsating cervical veins and liver.
2. Hypertrophy of heart.
3. Increase in size of liver.
4. Systolic murmur of tricuspid area.

DIFFERENTIAL DIAGNOSIS:

The presence of the murmur of an associated mitral insufficiency, which is usually present, complicated the diagnosis. The murmurs of mitral insufficiency and tricuspid insufficiency can be distinguished by the two points of maximal intensity. Occasionally mitral insufficiency may be mistaken for tricuspid insufficiency.

REMARKS:

Pure organic tricuspid insufficiency is extremely rare.

TRICUSPID STENOSIS.

SPECIAL ETIOLOGY:

1. Congenital.
2. Organic—may follow an organic tricuspid insufficiency.

SPECIAL SYMPTOMS:

1. Extreme cyanosis.
2. Marked dyspnoea.
3. Oedema.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Extreme cyanosis.
2. Marked dyspnoea.
3. Increased presystolic pulsation in cervical veins and liver.

Local.

1. May be precordial bulging and heaving.

II. Palpation.

1. Presystolic contraction of veins of neck.
2. Presystolic contraction of liver.
3. Presystolic or mid-diastolic thrill over tricuspid area.
4. Pulse—usually an extremely small radial pulse—nothing else noteworthy.

III. Percussion.

1. Enlargement of heart to right and upward.

IV. Auscultation.

1. Rumbling presystolic or mid-diastolic mur mur over tricuspid area.
2. Snapping first sound at tricuspid area.
3. Second pulmonic sound diminished.
4. Presystolic snapping sound over jugular vein.
5. Signs of an accompanying mitral stenosis and aortic stenosis.

MAIN POINTS IN THE DIAGNOSIS:

1. Marked cyanosis.
2. Marked dyspnoea.
3. Presystolic thrill over tricuspid area.
4. Hypertrophy of right ventricle.
5. Presystolic murmur at tricuspid area.

DIFFERENTIAL DIAGNOSIS:

May be taken to be a mitral stenosis.
Diagnosis may be difficult.

REMARKS:

Very rare and consequently diagnosis is difficult.

PULMONARY INSUFFICIENCY.

SPECIAL ETIOLOGY:

1. Congenital, very rare.
2. Functional or relative, on account of dilation of ring.
3. Organic—rare due to gonococcus almost always.

SPECIAL SYMPTOMS:

There are no special symptoms.

PHYSICAL SIGNS:

1. Inspection.
   Nothing characteristic.

II. Palpation.
   Nothing characteristic except absence of signs of aortic insufficiency.

III. Percussion.
   May be enlargement of heart to right.

IV. Auscultation.
   1. A soft, blowing diastolic murmur with maximum intensity at the plumonic area.
   2. First pulmonic sound normal.

MAIN POINTS IN THE DIAGNOSIS:

1. Absence of signs of aortic insufficiency.
2. Diastolic murmur at pulmonic area.

DIFFERENTIAL DIAGNOSIS:

1. From aortic insufficiency.
2. From Graham-Steele murmur of mitral stenosis.

REMARKS:

PULMONARY STENOSIS.

SPECIAL ETIOLOGY:

1. Congenital—practically all cases are congenital.
2. Organic—due to gonococcus.
3. Rarely due to sclerosis.

SPECIAL SYMPTOMS:

No special symptoms.

PHYSICAL SIGNS:

I. Inspection.
    May be a precordial bulging.
II. Palpation.
    May be a systolic thrill at pulmonic area.
III. Percussion.
    Enlargement of heart to right.
IV. Auscultation.
    1. A systolic murmur at pulmonic area.
    2. Second pulmonic sound diminished or absent.
    3. May be a diastolic murmur at pulmonic area.

MAIN POINTS IN THE DIAGNOSIS:

1. Hypertrophy of right heart.
2. Systolic murmur at pulmonic area.
3. Absence of signs of aortic stenosis.

DIFFERENTIAL DIAGNOSIS:

Aortic stenosis.

REMARKS:

Pulmonary stenosis is very rare.

The pulmonic area is Balfour's region of "auscultatory romance."

Systolic murmurs heard at the pulmonic area:

A. Functional (often disappear on change of position.)
    1. Anaemic murmurs.
    2. In thin chested people.
    3. Cardio-respiratory murmur.
    4. In fevers.
    5. During excitement and after violent exertion.
B. Organic.
    1. Mitral insufficiency.
    2. Aortic stenosis.
    3. Pulmonary stenosis.

CONGENITAL HEART LESIONS.

CLASSIFICATION OF CONGENITAL HEART LESIONS:

I. General Heart Anomalies.
  1. Acardia.
  2. Double heart.
  3. Dextro-cardia.
  4. Situs transversus.
  5. Ectopia cordis or ectocardia.
  6. Other abnormal situations of the heart in the thoracic, cervical or abdominal regions.

II. Anomalies of the Cardiac Septa.
  1. Cor. biloculars.
  2. Patent foramen ovale.
  3. Cor. triloculare (here the opening is at the "undefended space" of the interventricular septum.

III. Anomalies of the valves.
  A. Auriculo-ventricular valves.
    Anomalies of the auriculo-ventricular valves are extremely uncommon.
  B. Semilunar valves.
    I. Pulmonary valves.
      1. Supernumerary valves (there may be as many as five valves altogether).
      2. Biscuspid valves (rare).
      3. Atresia of the valves.
      4. Stenosis of the valves.
      5. Stenosis of the conus arteriosus of the right ventricle. In most of these cases the foramen ovale, ductus arteriosus, and the interventricular septum are all patent.
      6. Fenestrations.
    II. Aortic valves.
      1. Supernumerary valves. Rarer than at the plumonary orifice.
      2. Bicuspid valves.
      3. Atresia of the valves very rare.

4. Stenosis of the valves.
5. Stenosis of the conus arteriosus of the left ventricle. In most of these cases, also, the foramen ovale, the ductus arteriosus and the interventricular septum are patent.
6. Fenestrations (very common).

IV. Anomalies of the Large Arterial Trunks.
  1. Transpositions of the large arterial trunks.
  2. Patent ductus arteriosus.

ETIOLOGY:

1. Malformation of heart or its parts.
2. Malposition of heart or its parts.

SYMPTOMS:

1. Cyanosis. The "morbus caeruleus" or blue disease is due most frequently to congenital cardiac disorder.
2. Dyspnoea on slight exertion.
3. Cough.
4. Other symptoms of cardiac insufficiency.
5. Club fingers.
6. Polycythemia.
7. Lethargy of body and mind.

PHYSICAL SIGNS:

I. Inspection.
  General.
  1. Cyanosis.
  2. Dyspnoea.
  3. Cough.
  4. Clubbing of fingers and toes. "Hippocratic fingers," "Drum-stick fingers."
  Local.
  1. P. M. I. usually not visible.

II. Palpation.
  1. Thrill over base of heart.
  2. Enfeebled and displaced P. M. I.

III. Percussion.
  1. Increased cardiac dulness.

IV. Auscultation.
  1. A loud, rough, musical murmur heard over

the base of the heart. May be over entire precordium. May be systolic or diastolic or both in time. The "machinery murmur."

MAIN POINTS IN THE DIAGNOSIS:

1. Extreme cyanosis.
2. Dyspnoea.
3. Thrill.
4. Hypertrophy of heart.
5. "Machinery murmur."

DIFFERENTIAL DIAGNOSIS:

1. Extreme mitral stenosis.
2. A combination of chronic disease of the valves with great decompensation.

REMARKS:

Diagnosis may be difficult and is usually made easy by the use of the electrocardiograph.

Congenital heart lesions are usually incompatible with active adult life.

ANEURISMS.

CLASSIFICATIONS:

Anatomical Classification:

1. True aneurism.
    - a. Dilatation.
    - b. Circumscribed—saccular.
    - c. Dissecting.
2. False aneurism.
3. Arterio-venous aneurism.
    - a. Aneurismal varix — direct arterio-venous aneurism.
    - b. Varicose aneurism—indirect arterio-venous aneurism with sac between.
4. Special forms of aneurism.
    - a. Mycotic, due to bacteria.
    - b. Erosion.
    - c. Parasitic or verminous—*strongylus armata.* (does not occur in man).
    - d. Traction.

Clinical Classification:

1. Latent aneurisms.
2. Aneurisms with symptoms.
3. Aneurisms with physical signs.
4. Aneurisms with both symptoms and physical signs.

ETIOLOGY:

1. Arteriosclerosis due to Venus (lues and sexual excess), Vulcan (over-work), Mars (worry), Bacchus (alcoholism) and Epicureus (over-eating).
2. Acute specific fevers.
3. Blood toxins as lead, arsenic, etc.
4. Metabolic toxins as those of gout or Bright's disease.

SYMPTOMS:

1. Pain.
2. Tumor.

TYPES:

1. Aneurisms of the Thoracic Aorta.
    - a. Aneurism of the ascending aorta.
    - b. Aneurism of the transverse aorta.
    - c. Aneurism of the descending aorta.
2. Aneurisms of the abdominal aorta.
3. *Arterio*-venous aneurisms.

ANEURISM OF THE THORACIC AORTA.

SPECIAL ETIOLOGY:

1. Lues.

SPECIAL SYMPTOMS:

1. Pain.
2. Cough.
3. Dysphonia or aphonia.
4. Dysphagia.
5. Dyspnoea.
6. Haemoptysis if aneurysm is "weeping" into trachea or oesophagus.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Cyanosis.
2. Unilateral flushing and sweating.
3. May be an oedema of one upper extremity, usually the right.
4. Unequal pupils (anisocoria) and unilateral ptosis.
5. Distended veins over thorax, shoulders and neck.
6. May be a visible tracheal tug. (Oliver.)
7. May be a paralysis of one or both vocal cords causing a dysphonia or aphonia.

Local.

1. Expansile pulsation over precordium.
2. Bulging precordium.
3. P. M. I. often displaced.

II. Palpation.

1. May feel expansile pulsation.
2. Systolic thrill.
3. Diastolic shock.
4. Tracheal tug of Oliver.
5. Pulse—volume full, tension high, usually regular in force and rhythm, two radial pulses may differ in tension or rate. Vessel wall usually palpable and sclerosed. Pulse in abdominal aorta and femorals may rarely be obliterated or attenuated.

III. Percussion:

1. Area of relative or absolute dulness over aneurism.

2. Cardiac dulness increased or displaced.
3. Unilateral pulmonary dulness.
4. Hydrothorax may be present.
5. Smith's percussion tracheal thrill.

IV. Auscultation:

1. Accentuated second sound over aneurysm.
2. Systolic murmur over aneurysm.
3. Often an aortic diastolic murmur.
4. Enfeeblement of breath sounds over one lung.
5. Sometimes tubular breathing near aneurismal sac, due to bronchial compression.

MAIN POINTS IN THE DIAGNOSIS:

1. Expansile pulsation.
2. Systolic thrill.
3. Diastolic shock.
4. Tracheal tug.
5. Increased retrosternal dulness.
6. Systolic murmur.

DIFFERENTIAL DIAGNOSIS:

1. Aortic insufficiency.
2. Cases of fibroid phthisis.
3. Mediastinal tumors.
4. Dynamic pulsation of aorta.
5. Displaced heart due to scoliosis or kyphosis.
6. Pulsating empyema.

REMARKS:

Aneurism of the ascending aorta gives the most physical signs while aneurism of the transverse aorta gives the most symptoms. Aneurism of the descending aorta is rather difficult to diagnose because of frequent lack of both symptoms and signs.

Fluoroscopic examination is of great value in the diagnosis of aneurism.

Aneurism is a direct contraindication for the use of the stomach tube; therefore before passing this one should examine carefully for aneurism.

ANEURISM OF THE ABDOMINAL AORTA.

SPECIAL ETIOLOGY:

1. Arteriosclerosis.

SPECIAL SYMPTOMS:

1. Pain.
2. Intermittent claudication in legs.
3. Pulsation in abdomen.
4. Abdominal tumor.

PHYSICAL SIGNS:

I. Inspection.
   1. Abnominal tumor may be seen.
   2. May be abdominal pulsation.

II. Palpation.
   1. Expansile pulsation.
   2. May be systolic thrill.
   3. Diastolic shock.
   4. Pulse in two femoral arteries may vary in rate and tension.

III. Percussion.
   1. Dulness over aneurism.

IV. Auscultation.
   1. Systolic murmur.
   2. Second sound is usually accentuated.

MAIN POINTS IN THE DIAGNOSIS:

1. Expansile pulsation in abdomen.
2. Systolic thrill.
3. Diastolic shock.
4. Murmur.

DIFFERENTIAL DIAGNOSIS:

1. Any abdominal tumor.
2. Normal aortic pulsation in epigastrium.

REMARK:

Diagnosis may be difficult.

ARTERIO-VENOUS ANEURISM.

SPECIAL ETIOLOGY:

Stab wounds.

SPECIAL SYMPTOMS:

None.

PHYSICAL SIGNS:

Most important are:

I. Inspection.
  Dilation of veins over area of aneurism.
II. Palpation.
  1. Expansile pulsation.
  2. Systolic thrill over aneurism.
III. Percussion.
  None.
IV. Auscultation.
  1. Systolic murmur.
  2. Diastolic shock.
  3. "Machinery" murmur.

DIFFERENTIAL DIAGNOSIS:

Not difficult.

REMARKS:

Arterio-venous aneurisms usually occur in the extremities and can often be cured by surgical treatment.

THE RESPIRATORY SYSTEM.

THE NORMAL RESPIRATORY SYSTEM.

PHYSICAL SIGNS:

I. Inspection.
   1. Normally no dyspnoea except on exertion.
   2. Respirations free and equal. In men breathing is abdomino-thoracic and in women and children thoracico-abdominal in type.
   3. No diminution or inequality of expansion.
   4. No obliteration, retraction or pulsations of interspaces.
   5. No abnormal fulnesses.
   6. Litten's sign normally visible in all except very fat individuals.
   7. Costal angle normally 70 degrees or less than 90 degrees.

II. Palpation.
   1. Normally equal expansion.
   2. Normally vocal fremitus is greater over right side than left.
   3. Normally no friction fremitus.
   4. Normally no rhonchal fremitus.

III. Percussion.
   1. Types of percussion notes elicited over normal thorax.
      a. Normal vesicular resonance.
      b. Relative dulness over covered portions of heart and liver.
      c. Absolute dulness or flatness over uncovered portions of heart and liver.
      d. Tympany in Traube's semilunar space.

      Normally the note at the right apex is shorter, higher pitched and less resonant than at the left apex. This may be due to the presence of the large vessels or to better muscular development on the right.

      Dulness or tympany in areas other than the above is pathological.
   2. Normally no change in note on opening mouth.

3. Normally resistance is not marked.
4. Normally bases of lungs are co-extensive and co-expansile.

IV. Auscultation.

1. Types of breath sounds heard over normal lungs.
    - a. Normal vesicular breath sounds. Inspiration longer than expiration which is usually scarcely audible; inspiration higher in pitch and more intense than expiration.
    - b. Tubular or bronchial breath sounds as heard over the trachea; inspiration and expiration equal in duration, intensity and pitch.
    - c. Broncho-vesicular breath sounds a combination of the normal vesicular breath sounds and tubular breath sounds: Usually heard over right apex and in I and II right interspaces where lung covers the right bronchus, in duration, intensity and pitch expiration is almost equal to inspiration.

    The presence of tubular or broncho-vesicular breath sounds in areas other than the above or any enfeeblement of breath sounds is abnormal.
2. Types of vocal resonance elicited over normal thorax.

Spoken voice sounds.

- a. Vesicular vocal resonance: Diffuse, distant, variable intensity, vibratory. Heard over normal lung.
- b. Tracheal vocal resonance or bronchophony. Shocking, close, very intense, very vibratory. Heard over trachea.

Whispered voice sounds.

- a. Not usually heard over normal lungs.
- b. Tracheal whispered vocal resonance

or pectriloquy: "No shock or thrill, but an intense, high pitched tubular sound with a sensation as if a current of air were directed into the ear through the stethoscope." (Flint.)

Heard over trachea.

Bronchophony, pectriloquy or any impairment in the vesicular vocal resonance is pathological.

3. Normally no adventitious sounds are heard in the lungs.

DISEASES OF THE RESPIRATORY SYSTEM.

Bronchiectasis.
Lobar pneumonia.
Bronchopneumonia.
Tuberculosis.
Pleurisy.
Pneumothorax.

BRONCHIECTASIS.

CLASSIFICATIONS:

I. Pathological.
  1. Cylindrical.
  2. Saccular.

II. Clinical.
  1. Bronchiolectasis.
    a. Acute.
    b. Chronic.
  2. Bronchiectasis.
    a. Pure.
      1.—Chronic bronchitis.
      2.—Broncho-phenmonic.
      3.—Chronic pneumonic.
      4.—Pneumonic.
      5.—Pleuritic.
    b. Tuberculous.
  2. Aneurism.
      2.—Tumor.
      3.—Foreign body.
      4.—Lues.
    d. *Bronchiectasis universalis* of Grawitz.

ETIOLOGY:

I. Obstruction from above as
  1. Trauma.
  2. Aneurism.
  3. Tumor.

II. Weakening of the bronchial walls with subsequent dilation. Occurs often in cases of bronchitis following pneumonia or after acute infections or emphysema chronic phthisis, or chronic pleurisy at the base of the lung.

SYMPTOMS:

1. Cough peculiar in quality. Usually occurs in the morning or may occur on change in position usually followed by
2. Expectoration of a large amount of a gray, fluid, purulent, malodorous sputum.
3. May be dyspnoea.

PHYSICAL SIGNS:

The physical signs are inconstant depe

the fulness of the cavity and are frequently present only in moderately advanced cases.

I. Inspection.

General.

1. May rarely be cyanosis.
2. Occasionally Hippocratic fingers.

Local.

1. The affected side may be contracted.

II. Palpation.

1. If the cavities are empty and the pleura not thickened the vocal fremitus may be increased.

III. Percussion.

1. If the cavities are large and empty the percussion note is amphoric.
2. The percussion note is usually impaired because of infiltration.

IV. Auscultation.

1. Amphoric breathing.
2. Bubbling and musical rales.
3. Vocal resonance increased.

MAIN POINTS IN THE DIAGNOSIS:

1. Sputum.
2. Contraction of affected side.
3. Amphoric resonance.
4. Amphoric breathing.
5. Large, moist rales.

DIFFERENTIAL DIAGNOSIS:

1. Limited pleural cavity communicating with a bronchus.

REMARKS:

X-Ray is often of valuable assistance in confirming and making the diagnosis.

LOBAR PNEUMONIA.

CLASSIFICATIONS:

Clinical:

1. Apical pneumonia.
2. Migratory pneumonia.
3. Double pneumonia.
4. Massive pneumonia.
5. Central pneumonia.

ETIOLOGY:

1. Pneumococcus.

Group I	Distinguished by agglutination tests.
Group II.	Usually severe. Can be treated with sera.

   Group III. — Pneumococcus mucosus, may be a streptococcus. Usually fatal.

   Group IV.—Organisms not in other groups. Usually benign.

2. Bacillus influenzae—usually pseudo-lobar pneumonia.
3. Bacillus tuberculosis.
4. Bacillus friedlanderi.
5. Other bacilli.

SYMPTOMS:

1. Chill.
2. Pain in side of chest.
3. Dyspnoea.
4. Cough.
5. Expiratory grunt.
6. Bloody expectoration.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Flushed facies. May be unilateral.
2. Patient may be lying on affected side to restrict movement and lessen pain.
3. Use of accessory muscles of respiration.
4. Herpes labialis.

Local.

1. Diminished expansion on affected side.
2. P. M. I. may be increased if left lung is

involved because of consolidation of *lingula pulmonis.*

3. Affected side may be increased in circumference.
4. Rarely obliteration of interspaces.
5. Litten's sign is obliterated.

II. Palpation.

1. Increased vocal fremitus. May be diminished or absent if bronchi are plugged.
2. Diminished expansion.
3. May be tactile friction fremitus due to pleurisy.
4. Liver may be displaced downward if right lung is massively involved.
5. Pulse.—Volume full, tension low, regular in force and rhythm, rate rapid may be bounding, vessel wall palpable according to sclerosis.

III. Percussion.

1. Diminished or impaired resonance over affected area.
2. Increased resistance.
3. Rarely skodaic resonance.
4. Rarely "cracked pot" sound.
5. Rarely Wintrich's change in pitch.
6. May be compensatory increase in resonance on unaffected side.
7. Cardiac dulness may be increased if right ventricle is dilated.

IV. Auscultation.

1. Suppression of breath sounds in earliest stages.
2. *Crepitatio indux* or crepitant rales in early stages.
3. Tubular or bronchial breathing.
   Exceptions:
   a. In early stages of disease.
   b. Massive consolidation with plugged bronchi.
   c. Central pneumonia.
4. Bronchophony.
5. Rarely egophony.
6. May have pectoriloquy.

7. Pleural friction rub or perhaps pleural percardial friction rub.
8. *Crepitatio redux* or subscriptant rales during resolution.
9. Second pulmonic sound is accentuated unless right ventricle is dilated when this sound is enfeebled.

MAIN POINTS IN THE DIAGNOSIS:

1. Sudden onset.
2. Sputum.
3. Use of accessory muscles of respiration.
4. Obliteration of Litten's sign.
5. Diminished expansion.
6. Increased vocal fremitus.
7. Consolidation.
8. Suppression of breath sounds in earliest stages.
9. Crepitant rales.
10. Tubular breathing.
11. Broncophony.
12. Pectoriloquy.

DIFFERENTIAL DIAGNOSIS:

1. Pleurisy with effusion.
2. Acute tuberculous pneumonia.
3. Pseudo-lobar pneumonia of broncho-pneumonia.

REMARKS:

X-ray may help in diagnosing and locating consolidation.

The pathological stages of lobar pneumonia

1. Engorgement.
2. Red hepatization.
3. Grey hepatization.
4. Resolution.

The sputum is fairly characteristic. At first it is viscid and usually clear—then rusty, turning to prune juice color and finally mucous in character.

Termination may be by:

1. Crisis: sudden fall of temperature, dyspnoea and cessation of symptoms.
2. Lysis: gradual fall of temperature and slow recovery.

Complications:

1. Pleurisy—inevitable.
2. Empyema.
3. Delayed resolution.
4. Pulmonary abscess.
5. Pulmonary gangrene.
6. An exacerbation of an old pulmonary tuberculosis.
7. Pericarditis.
8. Endocarditis.
9. Myocardial failure.
10. Meningitis.
11. Phlebitis.
12. Thrombosis and embolism.
13. Arthritis.
14. Peripheral neuritis (very rare).
15. Peritonitis (very rare).
16. Parotitis: in children often associated with pericarditis.

BRONCHO-PENUMONIA.

CLASSIFICATION:

- I. Primary acute broncho-pneumonia.
- II. Secondary broncho-pneumonia.
  - 1. After acute specific fevers.
    - a. Moribilli.
    - b. Scarlatina.
    - c. Pertussis.
    - d. Diphtheria.
  - 2. Terminal in debilitating diseases.
  - 3. Aspiration or deglutition pneumonia.

ETIOLOGY:

Primary acute broncho-pneumonia.

1. Infection with pneumococcus (most frequent).
2. Streptococcus pyogenes alone or combined.
3. Staphylococci.
4. Bacillus pneumoniae.
5. Bacillus influenzae.
6. Bacillus tuberculosis.

Secondary broncho-pneumonia.

1. Secondary infection due to lowered resistance.
2. Inhalation of food particles, sputum, material from bronchiectatic cavity, etc.

SYMPTOMS:

Primary form.

1. Chill.
2. Perhaps convulsion.
3. Fever.
4. Dyspnoea.

Secondary form.

1. Sudden chill or rise in temperature in course of convalescence from acute infection.
2. Sudden cough (may be painful).
3. Rapid dyspnoea.

TYPES:

Acute capillary bronchitis or bronchiolitis. Desseminated small areas of broncho-pneumonia. Pseudo lobar pneumonia.

PHYSICAL SIGNS:

I. Inspection.

General.

1. Often cyanosis.
2. Dyspnoea.

Local.

1. Retraction of interspaces during inspiration.
2. May be sinking of lower sternum during inspiration—"funnel chest."

II. Palpation.

1. Vocal fremitus apt to be disminished in capillary bronchitis.
2. Vocal fremitus increased in localized broncho-pneumonia.
3. Rhonchal fremitus may be present.

III. Percussion.

1. May be no change in mild cases.
2. Patchy areas of dulness in many cases.

IV. Auscultation.

1. In most cases fine crackling or sub-crepitant rales on inspiration.
2. In capillary bronchitis there are many piping musical rales.
3. Localized areas of tubular breathing.
4. Vocal resonance is increased over localized areas.
5. Rarely a pleural friction rub.

MAIN POINTS IN THE DIAGNOSIS:

1. Mode of onset in secondary cases.
2. Usually bilateral.
3. Small localized areas of dulness.
5. Musical rales.

DIFFERENTIAL DIAGNOSIS:

Lobar pneumonia.

REMARKS:

Broncho-pneumonia occurs usually in children or in old debilitated individuals.

Termination of broncho-pneumonia:

1. Resolution.
2. Suppuration and gangrene in deglutition broncho-pneumonia.
3. Delayed resolution or chronic broncho-pneumonia.

PULMONARY TUBERCULOSIS.

CLASSIFICATION:

Clinical.

- I. Acute military tuberculosis.
  - a. Limited to lungs alone.
  - b. "Typhoid"—all organs involved.
  - c. Accompanying a meningitis.
- II. Acute pneumonia or Tuberculo-pneumonic phthisis.
  - a. Lobar or pneumonic.
  - b. Bronchial.
- III. Subacute pulmonary tuberculosis.
- IV. Chronic pulmonary tuberculosis.
  - a. Chronic ulcerative.
  - b. Chronic fibroid.

ETIOLOGY:

1. Bacillus tuberculosis of Koch.
2. Bacillus of bovine tuberculosis (questionable).

SYMPTOMS:

1. Haemoptysis—may occur early.
2. Neurasthenic manifestations.
3. Lassitude and *ennui*.
4. Digestive disturbances.
5. Afternoon headache.
6. Chill or sweat in the afternoon. May also be nocturnal.
7. Slight periodic elevations in pulse and temperature.
8. Dermatographia.
9. Cold, clamy hands.
10. Loss of weight.
11. Matinal expectoration.
12. Matinal cough.

REMARKS:

Modes of onset:

1. Insidious.
2. Glandular.
3. Fistula in ano.
4. Catarrhal.
5. Pleuritic.

6. With haemoptysis.
7. Laryngeal.
8. Malarial.
9. Nervous.
10. Febrile.
11. Anaemic.
12. Gastric.
13. Diarrhetic.
14. Typhoidal.
15. Acute pneumonic.
16. Arthritic.

Types of chests seen in plumonary tuberculosis.

1. Normal.
2. Emphysematous.
3. Elongated and flattened.
4. Alar chest. Due to increased angulation of ribs and loss of adipose tissue allowing scapulae to project.

The early diagnosis may be helped by the use of tuberculin tests (Calmette and Pirquet) and the X-ray. One should not wait until acid fast organisms are found in the sputum.

PULMONARY MILIARY TUBERCULOSIS.

SPECIAL SYMPTOMS:

1. High active fever (may be of reverse type.
2. Cough.
3. Dyspnoea.

PHYSICAL SIGNS:

I. Inspection.
  1. Flushed facies.
  2. May be herpes labialis.
  3. Dyspnoea.
  4. Emaciation.

II. Palpation.
  Nothing characteristic.

III. Percussion.
  1. At first no change.
  2. Later hypersonance.

IV. Auscultation.
  1. Musical and all kinds of moist rales.

MAIN POINTS IN DIAGNOSIS:

1. Fever.
1. Musical and all kinds.
2. Absence of evidence of other disease.
3. Characteristic rales.

DIFFERENTIAL DIAGNOSIS:

1. Typhoid fever.

REMARKS:

In acute fulminating tuberculous processes tuberculin tests are most likely negative.

TUBERCULOUS LOBAR PNEUMONIA.

The Symptoms and Physical Signs are closely allied to those of acute lobar pneumonia.

MAIN POINTS IN THE DIAGNOSIS:

1. Absence of sufficient etiological proof of acute lobar pneumonia.
2. Reverse type of fever.
3. Presence of acid fast organisms in sputum.
4. Positive tuberculin tests.

DIFFERENTIAL DIAGNOSIS:

1. Acute lobar pneumonia.

REMARKS:

The sputum in acute tuberculous lobar pneumonia does not usually show abundant acid fast bacilli in the early stages. It is less likely to be rusty and is usually tenacious. Later it may assume a more or less characteristic green color.

Always be on the watch for this disease if a case of acute lobar pneumonia does not end by crisis or lysis within two weeks from the date of onset.

The type of rise in temperature may be helpful in the diagnosis as remissions of 1.5 degrees or 2 degrees are not uncommon.

TUBERCULOUS BRONCHO-PNEUMONIA.

SPECIAL SYMPTOMS:

1. Reverse type of fever.
2. Sweats.
3. Chills.

PHYSICAL SIGNS:

Closely alike those of ordinary acute broncho-pneumonia.

MAIN POINTS IN DIAGNOSIS:

1. Special symptoms.
2. Presence of acid fast organisms in sputum (may not be until late).
3. Tuberculin tests.

REMARKS:

Tuberculous Broncho-pneumonia is "galloping consumption" or *phthisis florida.*

A sequela in children often of:

1. Morkilli.
2. Pertussis.

There may also be a deglutition type of tuberculous broncho-pneumonia.

CHRONIC ULCERATIVE TUBERCULOSIS.

SPECIAL SYMPTOMS:

None.

PHYSICAL SIGNS IN INCIPIENT CASES:

- I. Inspection.
  - 1. Usually in negative.
- II. Palpation.
  - 1. Usually is no change.
- III. Percussion.
  - Caution:—Percussion in this disease must be very light.
    Remember the "lung reflex" of Adams.
    Remember that the right apex is normally slightly duller than the left.
  - 1. May be no change in the percussion note.
  - 2. May be impairment at:
    - a. The apex and extending downward.
    - b. A place 1 or 2 inches below the apex and extending downward. This is the most common location of change in percussion note.
    - c. The apex of the lower lobe.
- IV. Auscultation:
  - 1. May be slight enfeeblement of the breath sounds. This is often one of the first signs and precedes tubular breathing. It is due to the fact that expansion is limited or that the alveoli may be filled with secretions.
  - 2. Fine crackling or crepitant rales at the end of inspiration. Are of the type known as dry. Must persist.
  - 3. May be a slight "cog-wheel" breathing.
  - 4. Inspiration may be harsh.
  - 5. May have broncho-vesicular breathing.
  - 6. Vocal resonance may be slightly increased.
  - 7. Rarely a pleural friction rub may be present.

MAIN POINTS IN DIAGNOSIS:

1. Impairment of percussion note at apices.
2. Enfeeblement of breath sounds.
3. Crepitant rales.

DIFFERENTIAL DIAGNOSIS.

1. Thickened pleura.
2. Lobar pneumonia.

REMARKS:

CHRONIC ULCERATIVE TUBERCULOSIS.

PHYSICAL SIGNS IN CAVITY FORMATION:

- I. Inspection. Most important.
  1. Retraction of the affected side.
  2. Diminished expansion on the affected side.
  3. Wide area of cardiac pulsation at the apex of the lung.
- II. Palpation.
  1. Vocal fremitus increased.
  2. Rhonchal fremitus may be present.
  3. Pleural friction fremitus may be present.
- III. Percussion.
  1. Tympanitic or amphoric note.
  2. "Cracked-pot" resonance. Also occurs in:
     - a. Crying child.
     - b. Consolidation over a bronchus as in lobar pneumonia.
  3. Wintrich's change in pitch.
  4. Gerhardt's sign.
  5. Impaired resonance about the cavity.
  6. Increased resistance.
- IV. Auscultation.
  1. Amphoric or cavernous breathing.
  2. Bronchophony and whispering pectoriloquy.
     At times may have egophony.
  3. Tubular breathing around the cavity.
  4. Amphoric or cavernous rales.
  5. Increased distinctness of heart sounds.

MAIN POINTS IN DIAGNOSIS:

1. Retraction of affected side.
2. Diminishing expansion.
3. Increased vocal fremitus.
4. Amphoric note.
5. Amphoric breathing.
6. Cavernous rales.

DIFFERENTIAL DIAGNOSIS:

1. Gangrene of lung.
2. Pulmonary abscess.
3. Bronchiectasis.

REMARKS:

Cavity may also be found in:

- Gangrene.
- Abscess.
- Bronchiectasis.

To be recognized a cavity must be of at least moderate size and must be fairly near the surface. The cavity must also be empty and if it communicates with a bronchus the bronchus must be open.

FIBROID PHTHSIS.

TYPES:

- I. Pure fibroid diseases of the lungs or Pneumonokonioses.
  1. Anthracosis.
  2. Chalicosis.
  3. Siderosis.
- II. Tuberculous fibroid lung.
  Primary tuberculosis and secondary fibroid changes.
- III. Fibro-tuberculous lung.
  Primary fibroid and secondary tuberculous changes.

SPECIAL SYMPTOMS:

None.

PHYSICAL SIGNS:

- I. Inspection.
  1. Retraction of affected side.
  2. Diminished expansion.
  3. Clavicle depressed on affected side.
  4. Wide area of cardiac pulsation when the left lung is involved.
  5. Litten's sign may be absent.
  6. P. M. I. often displaced.
  7. Frequently scoliosis.
- II. Palpation.
  1. Usually diminished vocal fremitus.
- III. Percussion.
  1. Marked impairment of the percussion note reaching almost to flatness.
  2. Increased resistance.
  3. May have amphoric note at apices in cavity formation.
  4. Cardiac dulness may be changed.
- IV. Auscultation.
  1. Diminished breath sounds.
  2. Often enfeebled tubular breathing.
  3. Often signs of cavity formation at apices.
  4. Vocal resonance decreased as a rule.

MAIN POINTS OF DIAGNOSIS:

1. Retraction of affected side.

2. Diminished expansion.
3. Absence of Litten's sign.
4. Displacement of P. M. I.
5. Scoliosis.
6. Diminished vocal fremitus.
7. Impairment of percussion note.
8. Increased resistance.
9. Diminished breath sounds.
10. Enfeebled tubular breathing.

DIFFERENTIAL DIAGNOSIS:

1. Thickened pleura.
2. Pleurisy with effusion.

REMARKS:

A patient with fibroid phthisis may live for many years.

A frequent accompanying disorder is amyloid degeneration of the kidney, liver and spleen.

PLEURISY.

CLASSIFICATION:

Anatomical.

- A. Dry, adhesive, plastic or fibrinous pleurisy.
- B. Pleurisy with effusion or sero-fibrinous pleurisy.

Etiological.

- A. Primary Pleurisy.
- B. Secondary Pleurisy.

Clinical.

- A. Acute Pleurisy.
  1. Fibrinous.
  2. Sero-fibrinous.
     - a. Purulent or Empyema
     - b. Tuberculous.
     - c. Haemorrhagic.
     - d. Diaphragmatic.
     - e. Encysted.
  3. Interlobar.
- B. Chronic Pleurisy.
  1. Chronic adhesive.
  2. Chronic fibrinous.

ETIOLOGY:

Primary.

1. Tuberculosis.
2. Pneumococcus.
3. Streptococcus.
4. Rarely other organisms.
5. Simply exposure to cold.

Secondary.

1. Pulmonary infections
   - a. Pneumonia.
   - b. Tuberculosis.
2. Trauma.
3. Pulmonary carcinoma.
4. Pulmonary gangrene or abscess.
5. Mediastinitis.

SYMPTOMS:

1. Chill followed by fever.
2. Dyspnoea.
3. Cough.

4. Pain in side.
5. Onset may be insidious in children and elderly individuals.

TYPES:

Acute.
  - A. Dry plastic or fibrinous pleurisy.
  - B. Pleurisy with effusion.

Chronic.
  - C. Chronic adhesive pleurisy or Thickened pleura.

FIBRINOUS PLEURISY.

CLASSIFICATION:

A. Primary.
B. Secondary.

SPECIAL ETIOLOGY:

None.

SPECIAL SYMPTOMS:

May simply be pain in side.

PHYSICAL SIGNS:

I. Inspection.
  1. Thoracic movements shallow especially on the affected side.
  2. Patient is apt to lie on affected side.
  3. Probably a diminished Litten's sign.

II. Palpation.
  1. Tactile friction fremitus.
  2. Vocal fremitus usually unchanged.

III. Percussion.

  Probably no change, may be dulness in recurring attacks.

IV. Auscultation.
  1. Audible friction rub having these characteristics:
    a. Leathery sound (*bruit de cuif neuf*).
    b. Increased by pressure of stethoscope.
    c. May be scratchy and simulate rales closely.
  2. Enfeeblement of breath sounds.

MAIN POINTS IN THE DIAGNOSIS:

1. Diminished expansion.
2. Tactile friction fremitus.
3. Audible friction rub.
4. Enfeebled breath sounds.
5. Symptoms.

DIFFERENTIAL DIAGNOSIS:

1. Intercostal neuralgia.
2. Acute pericarditis.

REMARKS:

In diaphragmatic pleurisy there may be no signs.

Sounds simulating pleuritic friction rub.

1. Leathery muscle sound over scapulae usually during inspiration.
2. Rough, dry skin.
3. Hair.
4. Some sonorous rales.

PLEURISY WITH EFFUSION.

CLASSIFICATION:

- A. Unilateral.
  - 1. Basic.
  - 2. Encapsulated.
- B. Bilateral.

SPECIAL ETIOLOGY:

Usually bacterial.

SPECIAL SYMPTOMS:

- 1. Dyspnoea most marked.

PHYSICAL SIGNS OF UNILATERAL PLEURISY WITH EFFUSION.

- I. Inspection.
  - 1. Diminished expansion.
  - 2. Mensuration shows the affected side enlarged.
  - 3. Often obliteration of the interspaces.
  - 4. Litten's sign absent.
  - 5. Displacement of the P. M. I. in the opposite direction. May be either pushed by the effusion or pulled by the negative pressure in the other side.
  - 6. Compensatory expansion of the other side.
- II. Palpation.
  - 1. Diminished expansion of affected side.
  - 2. Vocal fremitus absent or diminished.
    - Exceptions.
      - a. In children.
      - b. When there is fluid over solidification.
  - 3. Vocal fremitus may be increased along upper border of the effusion.
  - 4. May be friction fremitus above the effusion.
  - 5. May feel the liver or spleen displaced by the effusion.
- III. Percussion:
  - 1. Impairment of percussion note or flatness below upper border of the effusion.
  - 2. Feeling of increased resistance.
  - 3. Tympanitic note or skodaic resonance just above effusion.

4. Shifting dulness. Demonstrate by percussing in the anterior axillary line in the sitting and recumbent positions.
5. Ellis' or Garland's S-shaped line. Due to capillary attraction of the effusion.
6. Grocco's paravertebral triangle of dulness, may be due either to the dulness being transmitted by the bodies of the vertebrae or to the bulging of the mediastinum caused by the effusion.
7. Cardiac dulness displaced in the direction away from affected side.
8. Hepatic and splenic dulness displaced downward.
9. May be obliteration of Traube's semilunar space.
10. Hyperresonance over other lung.

IV. Auscultation.

1. Diminished or absent breath sounds below the upper level of the effusion. In children these sounds may be loud and tubular.
2. Diminished or absent vocal resonance. May be distant but nasal over the whole effusion.
3. May be distant tubular breath sounds.
4. May be tubular breath sounds over encysted effusion.
5. May be egophony above effusion or near the upper level of the effusion.
6. May be friction rub above the effusion.
7. Maximal apical heart sounds displaced.
8. Second pulmonic sound often increased.
9. Compensatory exaggerated breath sounds over the opposite side.

MAIN POINTS IN THE DIAGNOSIS:

1. Diminished expansion.
2. Absence of Litten's sign.
3. Displaced P. M. I.
4. Diminished vocal fremitus over area involved.
5. Impairment of percussion note.
6. Increased resistance.

7. Displaced cardiac dulness.
8. Diminished breath sounds.
9. Diminished vocal resonance.
10. Friction rub above effusion.

DIFFERENTIAL DIAGNOSIS:

1. Acute lobar pneumonia, especially if massive.
2. Pericarditis with effusion.
3. Thickened pleura.
4. Neoplasms of the lung or pleura.
5. Abscess of the liver or hydatid cyst of the liver.
6. Subphrenic abscess.
7. Hydropneumothorax.

REMARKS:

Location of effusion.

1. Usually at base of lung.
2. May be free in pleural cavity.
3. May be encapsulated.

In pleurisy with effusion the fluid is an exudate. A transudate occurs in chronic passive congestion of lungs and in nephritis. This is the so-called hydrothorax.

Differences between transudate and exudate.

Transudate	**Exudate.**
Specific gravity lower than 1015.	Specific gravity greatter than 1020.
Albumin, 10-30 grams per liter.	Albumin, 30-60 grams per liter.
Fibrinogen, 0.1 grams per liter.	Fibrinogen, 1 gram per liter.

Paracentesis thoracis is best performed in the back at about the level of the V or VI dorsal spine, 8 to 10 ch. from mid line.

CHRONIC ADHESIVE PLEURISY.

SPECIAL ETIOLOGY:

1. Recurring attacks of acute pleurisy.
2. Result of a severe fibrinous or sero-fibrinous pleurisy.

SPECIAL SYMPTOMS:

1. Dyspnoea on exertion.
2. Pain in side on deep respiration.

PHYSICAL SIGNS:

I. Inspection:
  1. Retraction of the affected area.
  2. Diminished expansion on the affected side.
  3. Absence of Litten's sign on the affected side.
  4. Scoliosis with the convexity away from the affected side (may be slight). Compensatory curvature below in the opposite direction.
  5. The angles of the ribs are more prominent on the unaffected side.

I. Palpation:
  1. Diminished expansion.
  2. Vocal fremitus absent or diminished.

III. Percussion:
  1. Dulness or flatness over the thickened area or the affected side.
  2. Increased sense of resistance over the thickened area or the affected side.

IV. Auscultation:
  1. Diminished or absent breath sounds over the thickened area or affected side.
  2. Diminished or absent vocal resonance.

MAIN POINTS IN THE DIAGNOSIS:

1. Retraction of affected area.
2. Diminished expansion.
3. Absence of Litten's sign.
4. Scoliosis.
5. Diminished vocal fremitus.
6. Dull percussion note.
7. Increased resistance.

8. Diminished breath sounds.
9. Diminished voice sounds.

EMARKS:

Pleural adhesions may be very slight, in fact simply bands between lung and pleaura.

Eventually chronic adhesive pleurisy may lead to cirrhosis of the lung.

PNEUMOTHORAX.

CLASSIFICATION:

GAL. 20—HORN-SHAFER.

1. Pure pneumothorax.
2. Hydropneumothorax or
3. Pyopneumothorax.

ETIOLOGY:

1. Perforating wounds of the chest.
2. Perforation of the diaphragm.
3. Perforation of the lung.
   - a. Rupture of an air vesicle.
   - b. Local disease.
   - c. During aspiration.
4. Emphysema may rupture into the lung cavity.
5. Gas bacillus.

SYMPTOMS:

1. Onset usually slow and insidious.
2. Onset may be acute when there is dyspnoea, pain and a rapid, feeble pulse with usually a slight lividity—the *pneumothorax acutissimus* of Unverricht.

PHYSICAL SIGNS:

- I. Inspection.
  1. Marked enlargement of the affected side.
  2. Diminished expansion of the affected side.
  3. Interspaces may bulge but often are obliterated.
  4. Absence of Litten's sign.
  5. P. M. I. is usually displaced.
  6. Usually there is cyanosis.
- II. Palpation.
  1. Diminished expansion.
  2. Vocal fremitus is nearly always absent or diminished.
  3. The liver may be felt.
  4. Displaced P. M. I.
- III. Percussion.
  1. Tympanitic or amphoric note above the level of the fluid.
  2. Flatness or relative dulness below the level of the fluid. The level of the fluid is a straight line and not a curved line (Ellis or Garland line) as in pleurisy with effusion.

3. Shifting dulness is usually marked.
4. The cardiac dulness is markedly displaced.
5. The hepatic dulness is usually increased.
6. There is usually a compensatory resonance of the other side.

IV. Auscultation.

1. Breath sounds are usually diminished in intensity.
2. Entire absence of the breath sounds below the level of the fluid.
3. Amphoric quality to the breath sounds, particularly on inspiration.
4. The vocal resonance is diminished and the voice sounds are metallic or nasal in quality.
5. The Hippocratic succusion splash can usually be obtained.
6. The coin sound (*bruit d'airain*) is usually obtainable.
7. The falling drop sound is usually present.
8. Tinkling metallic rales on coughing.
9. The breath sounds on the opposite side are usually intensified.
10. The apical heart sounds are usually displaced.

MAIN POINTS IN THE DIAGNOSIS:

1. Diminished expansion.
2. Absence of Litten's sign.
3. P. M. I. displacement.
4. Diminished vocal fremitus.
5. Tympanitic note above fluid.
6. Flat note below fluid.
7. Shifting dulness.
8. Amphoric breathing.
9. Succussion splash.
10. Metallic rales.

DIFFERENTIAL DIAGNOSIS:

1. Pleurisy with effusion.
2. Hernia of the stomach through the diaphragm.
3. Subphrenic pyopneumothorax.

REMARKS:

Pure pneumothorax is rare; practically all cases *are either* a hydropneumothorax or a pyopneumo*thorax.*

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